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IRM College Webinar

Developing Metrics that Matter

Jay Alden

September 12 2007

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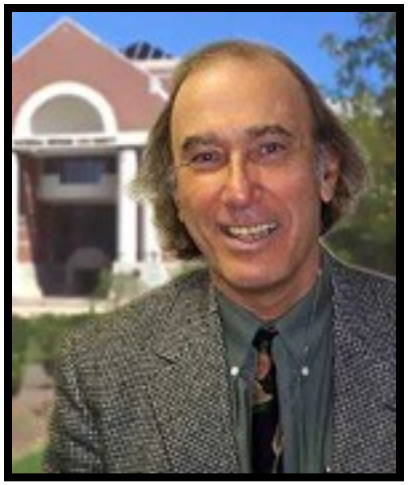
SPEAKER



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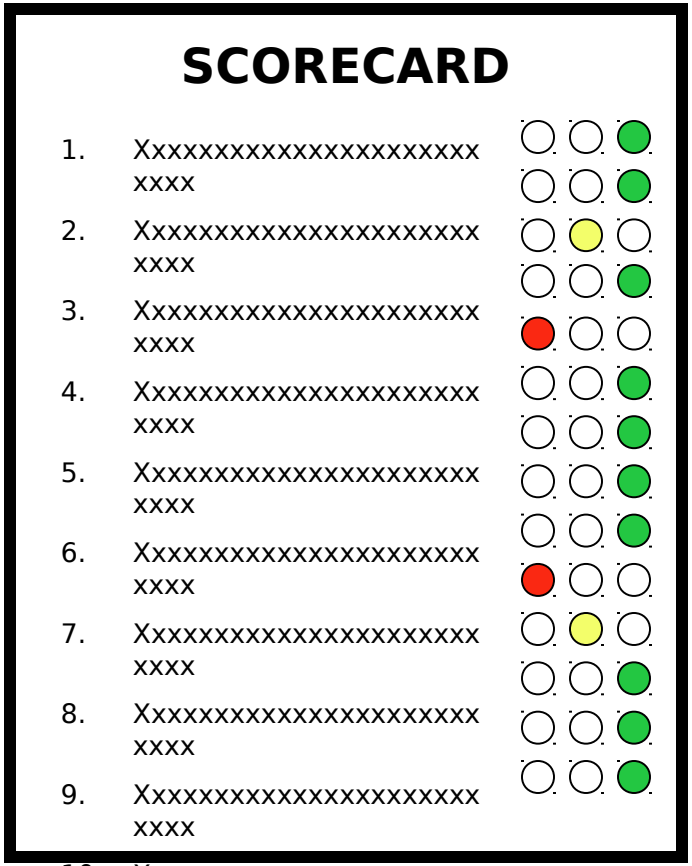
ORIENTATION

1. I will be presenting a series of visuals and talking about them as we proceed.
2. If you have a question or a comment to make at any time, just type it into the Chat box.
3. When I see entries in the Chat box, I'll stop at the next convenient point and try to answer your question.
4. There will also be a Q&A session scheduled for the end of the Webinar.

OVERVIEW

The performance of many organizations are assessed with a scorecard made up of a limited number of critical measures.

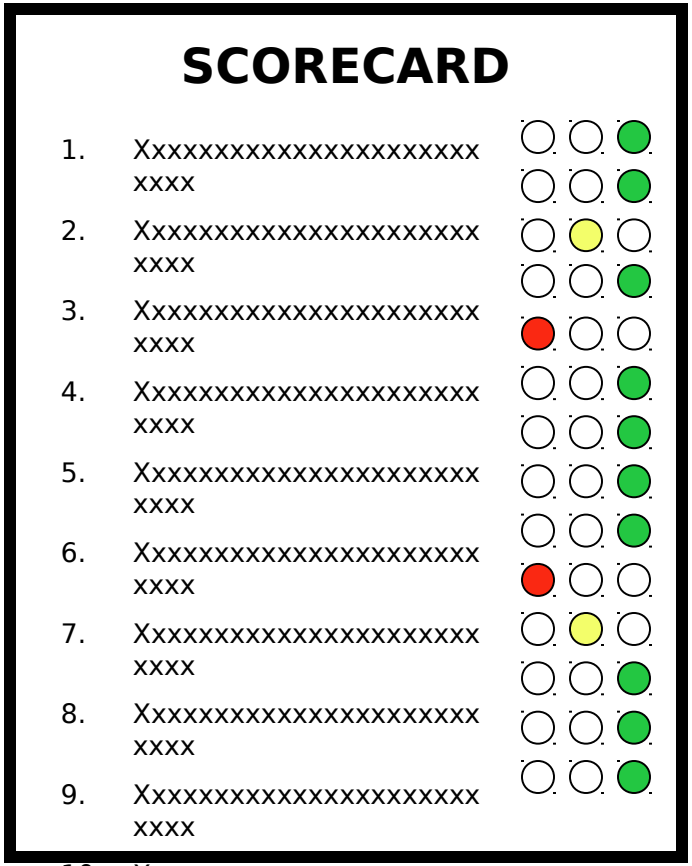
These measures *matter.*



OVERVIEW

Often, the vital few measures need to measure *abstract* factors:

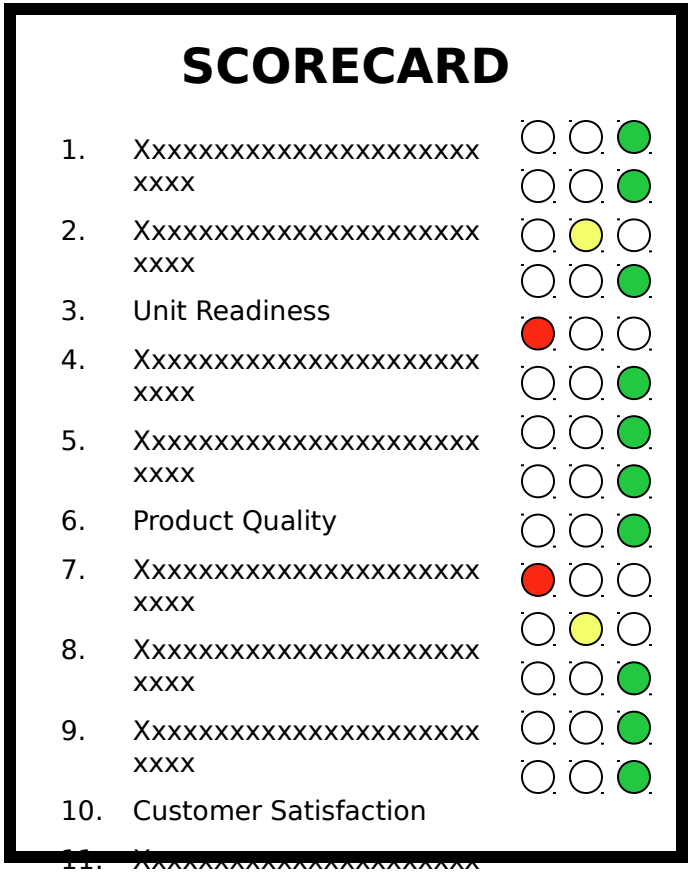
- Complex *multi-dimensional* issues
- The *quality* of something
- People's *attitude* about something



OVERVIEW

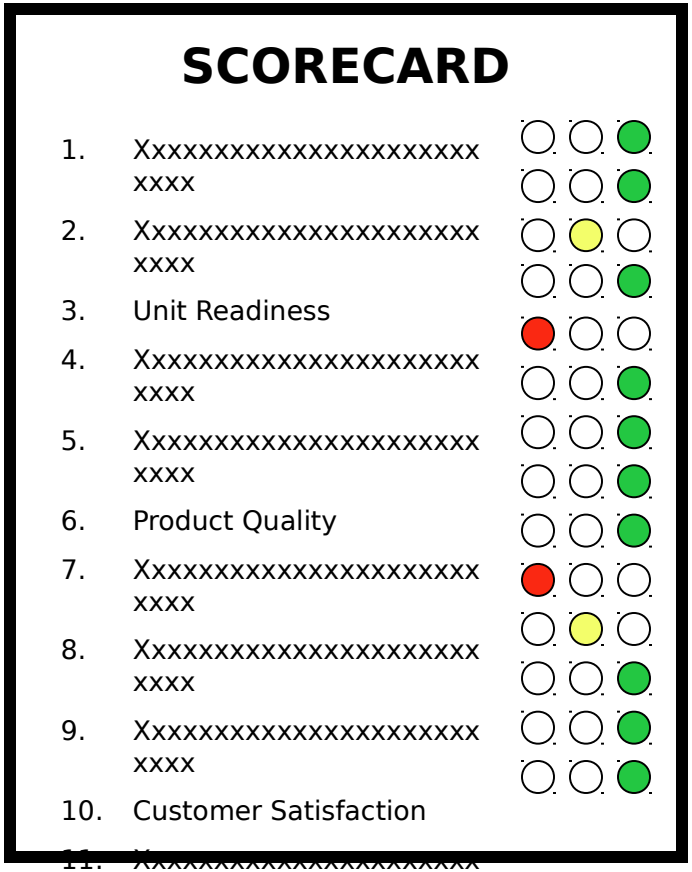
Often, the vital few measures need to measure *abstract* factors:

- *Unit Readiness*
- *Product Quality*
- *Customer Satisfaction*



OVERVIEW

Some people feel that you really can't put a numerical score on abstract factors – you just can't *measure* them.



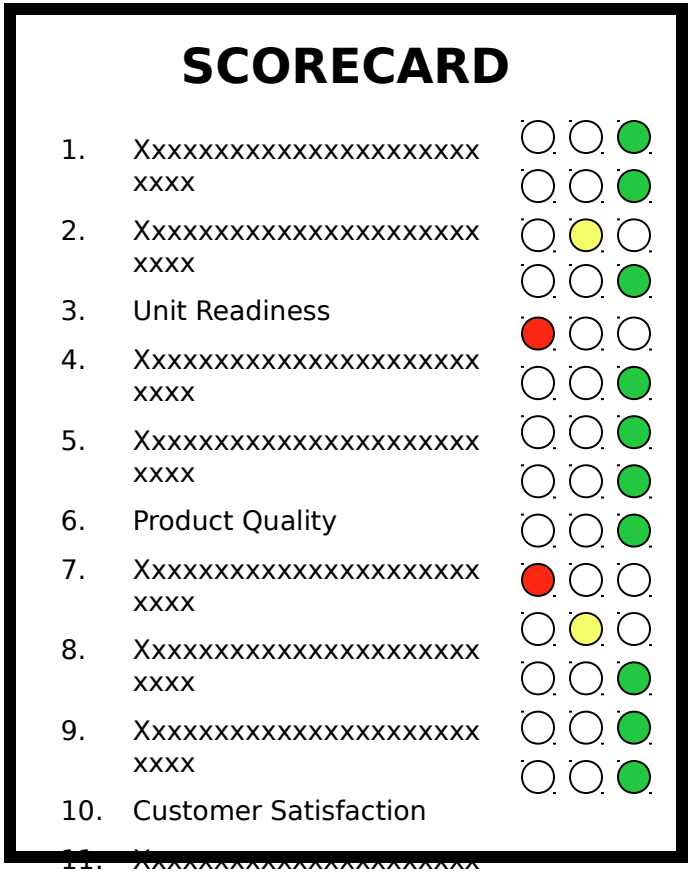
OVERVIEW

Some people feel that you really can't put a numerical score on abstract factors – you just can't *measure* them.

But how about measuring:

Human intelligence with IQ scores

Software Engineering



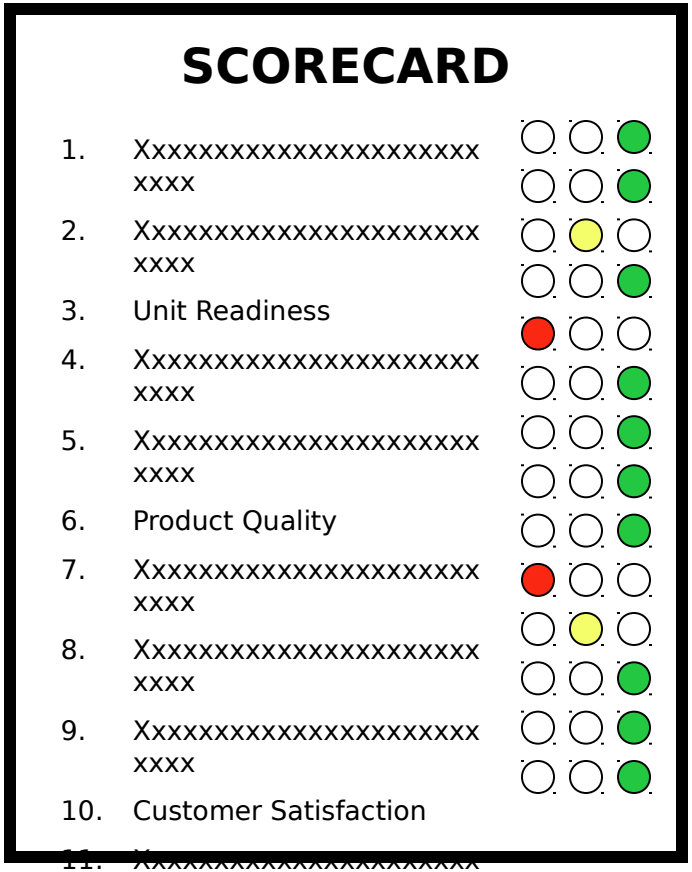
OVERVIEW

You <u>can</u> measure…

assign a meaningful numerical score to

…the things that matter to an organization – no matter how abstract.

It just takes time, effort, and an investment in the measurement process.



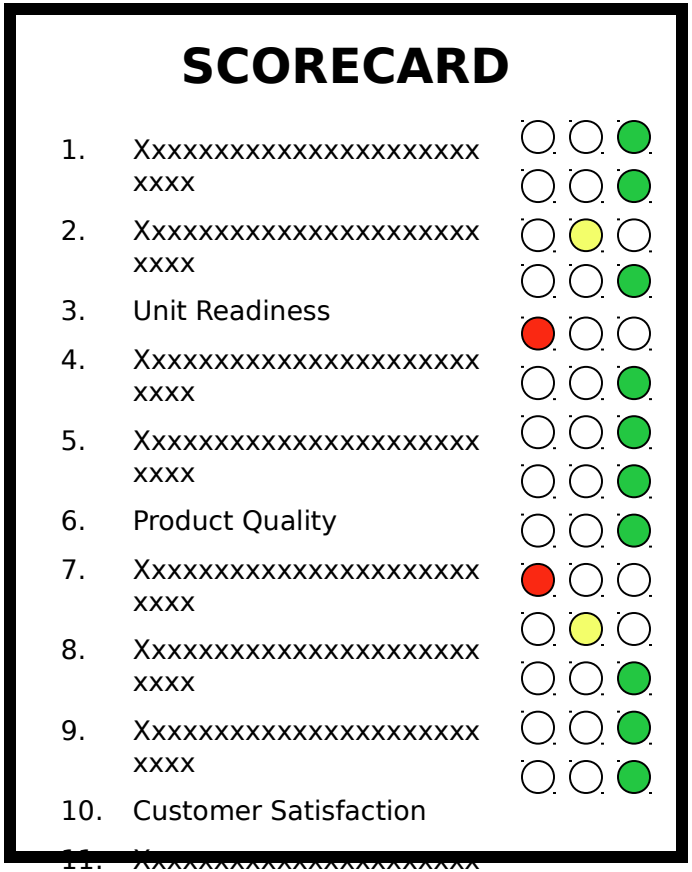
OVERVIEW

When faced with a need to assign a numerical score to a complex abstract factor that matters to the organization:

1. Find an *Indicator*

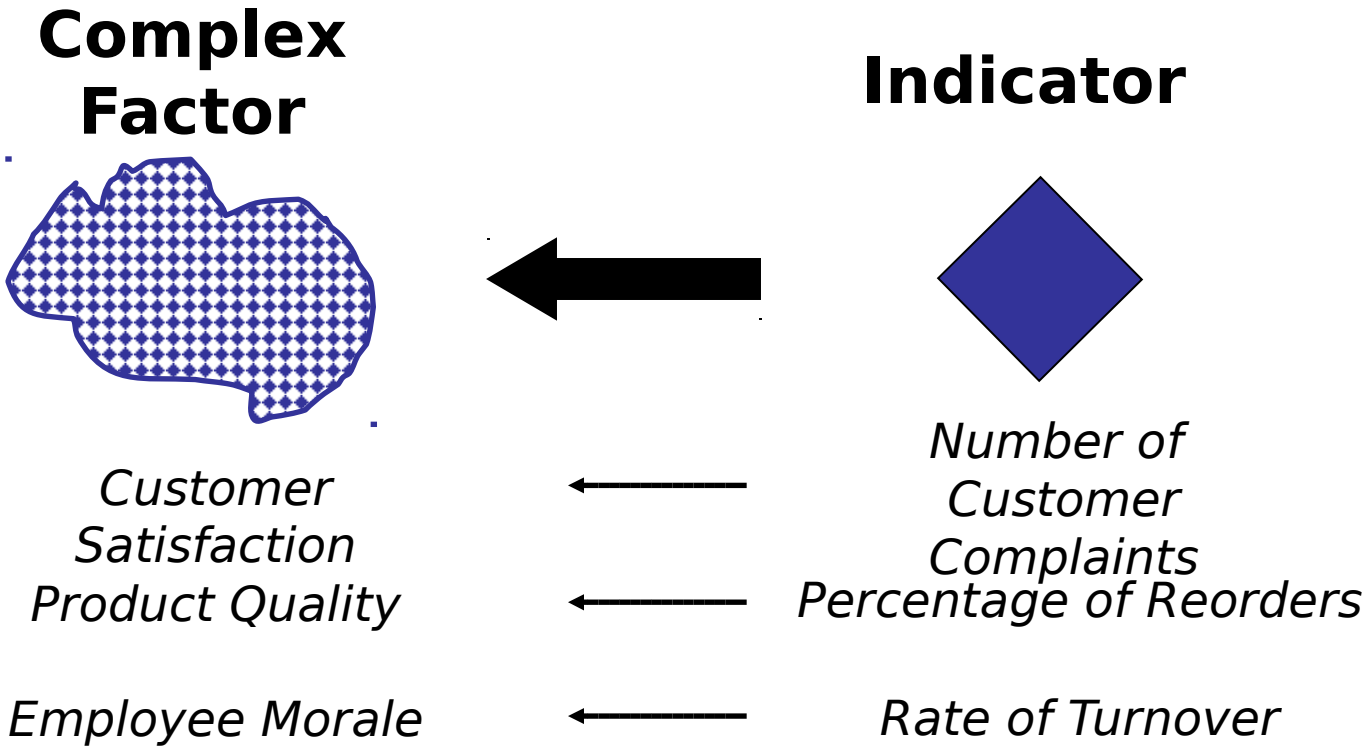
2. Build an *Index*

3. Construct an *Instrument*



1. FIND AN INDICATOR

Look for an easy-to-measure factor that somehow relates directly to the complex factor.



1. FIND AN INDICATOR

Face Validity: In the particular situation in which the measurement is being made, will the indicator, as a general rule, accurately represent the abstract factor?

Complex Factor		**Indicator**
Customer Satisfaction	←	*Number of Customer Complaints*
Product Quality	←	*Percentage of Reorders*
Employee Morale	←	*Rate of Turnover*

1. FIND AN INDICATOR

Face Validity: In the particular situation in which the measurement is being made, will the indicator, as a general rule, accurately represent the abstract factor?

If so:

Use the indicator to represent the abstract factor since the measurement process will tend to be inexpensive.

Measure	Intended Meaning
Number of Customer Complaints	*Customer Satisfaction*
Percentage of Reorders	*Product Quality*
Rate of Turnover	*Employee Morale*

1. FIND AN INDICATOR

Face Validity: In the particular situation in which the measurement is being made, will the indicator, as a general rule, accurately represent the abstract factor?

If Not:

You'll need a more sophisticated (and expensive) approach to measure the abstract factor:

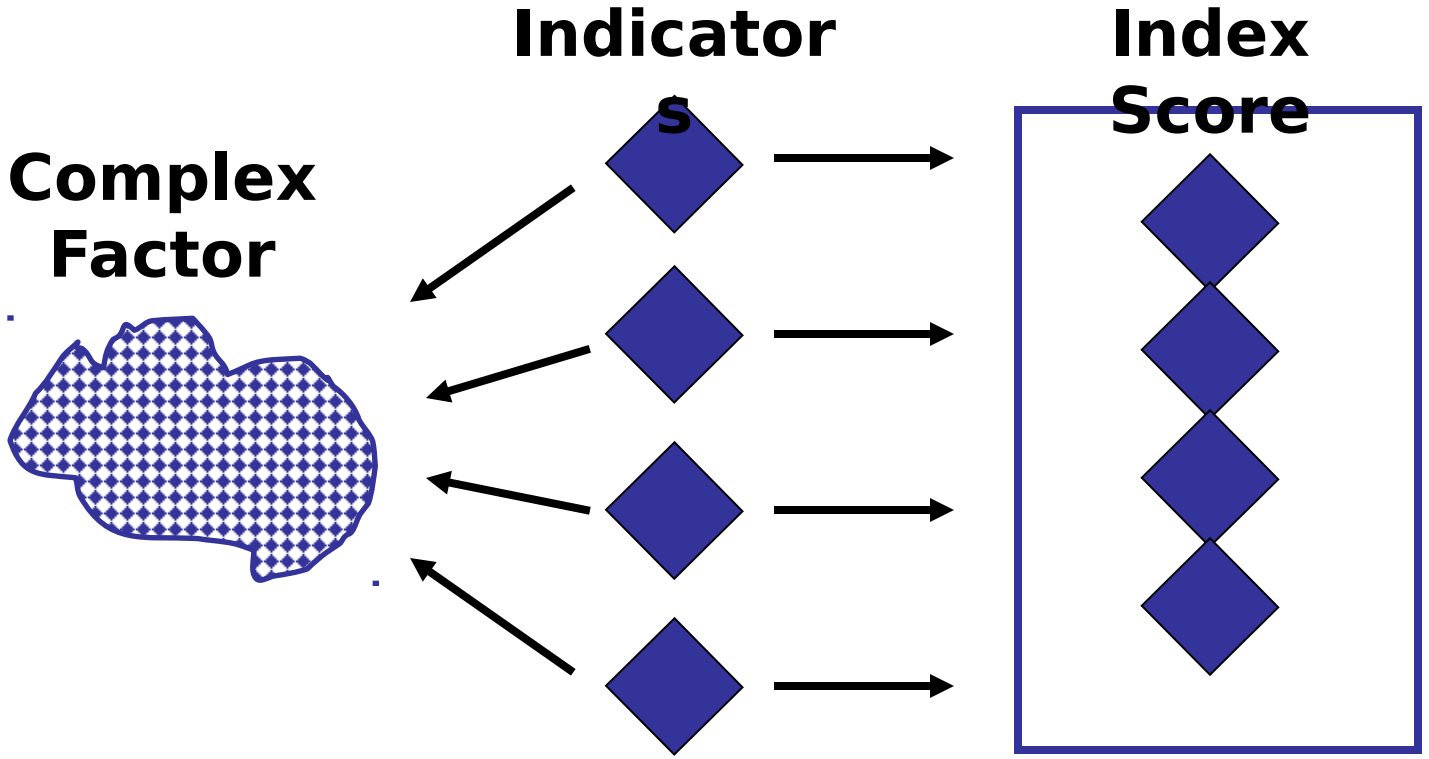
~~1. Find an *Indicator*~~

2. Build an *Index*

3. Construct an *Instrument*

2. BUILD AN INDEX

Identify a variety of independent indicators that, collectively, can represent the abstract factor



2. BUILD AN INDEX

Measures	Value		Weight.	Weighted Score
No. of fatalities due to on-job injury	1	X	0.60	No. Fatalities x Wt. [1 x 0.60 = 0.60]
No. of terminations due to on-job injury	7	X	0.30	No. terminations x Wt. [7 x 0.30 = 2.30]
No. of lost work days due to on-job injury	232	X	0.06	No. lost work days x Wt. [232 x 0.06 = 13.92]
No. of restricted work days due to on-job injury	540	X	0.04	No. restricted work days x Wt. [232 x 0.06 = 21.60]

SAFETY INDEX SCORE = 0.60 + 2.30 + 13.92 + 21.60 = 38.42

2. BUILD AN INDEX

a) Find potential indicators

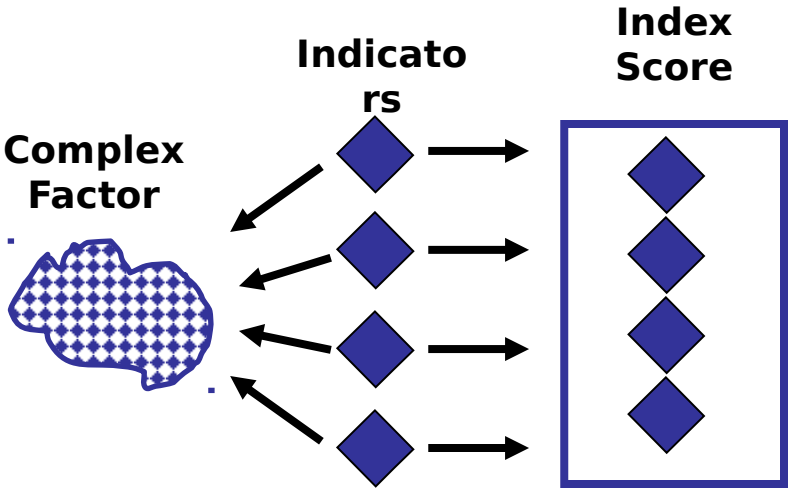
b) Select the best indicators

c) Assure a common scale among indicators

d) Adjust the indicators for "favorability"

e) Weight the indicators appropriately

f) Validate the index



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a) Find potential indicators

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Customer Satisfaction Index:

2. BUILD AN INDEX

a) Find potential indicators

Research factor in books, journals, Internet resources

Brainstorm

Customer Satisfaction Index:

- *No. of customer complaints*
- *No. customer testimonials*
- *Percent of customer reorders*
- *Increase/decrease in order size*
- *No. cancellations/returns*
- *No. items on backorders*
- *Waiting time*
- *Product error rate*

2. BUILD AN INDEX

a) Find potential indicators

b) Select the best indicators

Relevance

Importance

Ease of measurement

Customer Satisfaction Index:

- *No. of customer complaints*
- ~~*No. customer testimonials*~~
- *Percent of customer reorders*
- ~~*Increase/decrease in order size*~~
- *No. cancellations/returns*
- *No. items on backorders*
- *Waiting time*
- *Product error rate*

2. BUILD AN INDEX

a) Find potential indicators

b) Select the best indicators

c) Assure a common scale among indicators

Must be capable of being added or averaged

Percent of maximum practical value?

Customer Satisfaction Index:	MAX Value
• *No. of customer complaints*	20 =100
• ~~*No. customer testimonials*~~	
• *Percent of customer reorders*	50 = 100
• ~~*Increase/decrease in order size*~~	30 = 100
• *No. cancellations/returns*	
• *No. items on backorders*	
• *Waiting time*	10 = 100
• *Product error rate*	

2. BUILD AN INDEX

a) Find potential indicators

b) Select the best indicators

c) Assure a common scale among indicators

d) Adjust the indicators for "favorability"

Use "+" and "-" signs to indicate favorability

Customer Satisfaction Index:	MAX Value	
• *No. of customer complaints*	20	-
• ~~*No. customer testimonials*~~		
• *Percent of customer reorders*	50	+
• ~~*Increase/decrease in order size*~~		
• *No. cancellations/returns*	30	-
• *No. items on backorders*		
• *Waiting time*	10	-
• *Product error rate*		

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e) Weight the indicators appropriately

Based on *Importance* for measurement use

Customer Satisfaction Index:	MAX Value	Weight
• *No. of customer complaints*	20	- .30
• ~~*No. customer testimonials*~~		
• *Percent of customer reorders*	50	+ .25
• ~~*Increase/decrease in order size*~~		
• *No. cancellations/returns*	30	- .25
• *No. items on backorders*		
• *Waiting time*	10	
• *Product error rate*		- .20

2. BUILD AN INDEX

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e) Weight the indicators appropriately

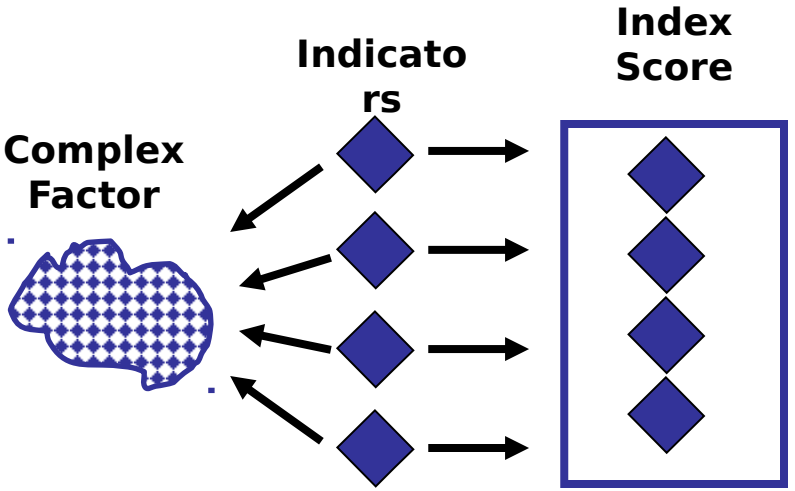
f) Validate the index

Face Validity
Content Validity

Customer Satisfaction Index:	MAX Value	Weight
• *No. of customer complaints*	20	- .30
• ~~*No. customer testimonials*~~		
• *Percent of customers reordered*	50	+ .25
• ~~*Increase/decrease in order size*~~		
• *No. cancellations/returns*	30	- .25
• *No. items on backorders*		
• *Waiting time*	10	
• *Product error rate*		- .20

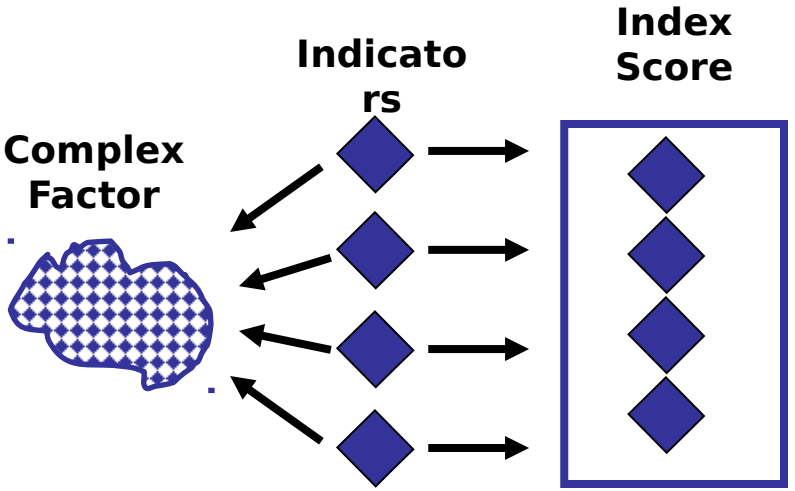
2. BUILD AN INDEX

- Lots of Work



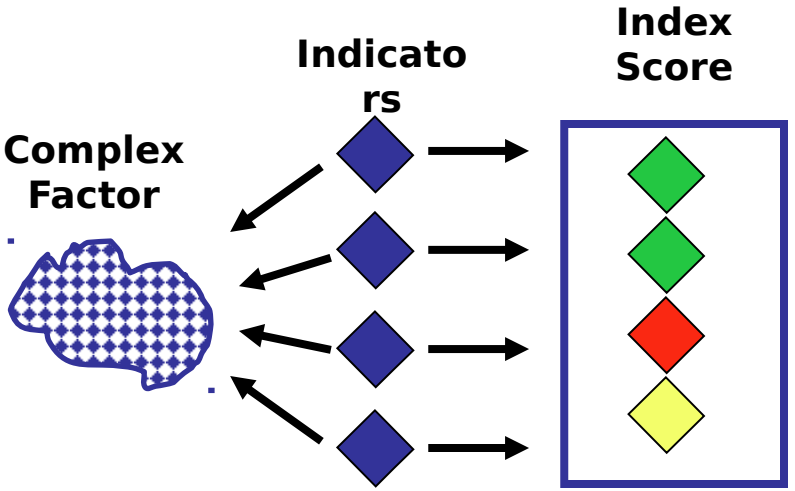
2. BUILD AN INDEX

- Lots of Work
- Necessary because use of measure is ***CRITICAL*** for organizational management



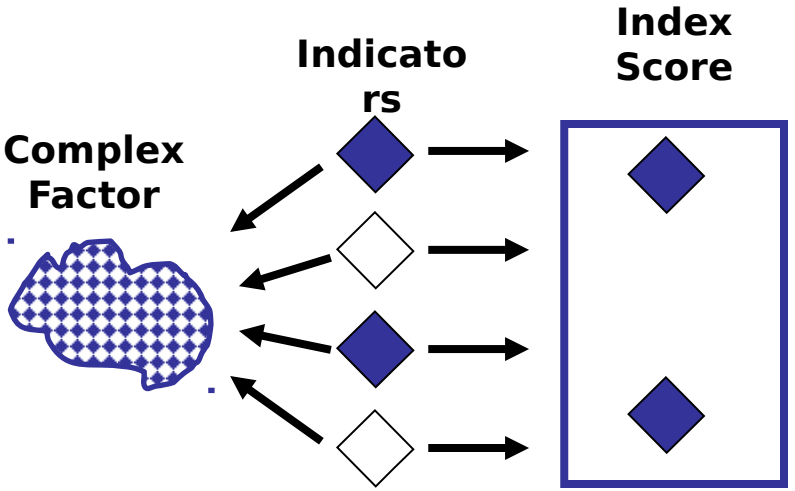
2. BUILD AN INDEX

- Lots of Work
- Necessary because use of measure is ***CRITICAL*** for organizational management
- Provides ability to drill down to critical component metrics



2. BUILD AN INDEX

- Lots of Work
- Necessary because use of measure is ***CRITICAL*** for organizational management
- Provides ability to drill down to critical component metrics
- But,… there may not be enough practical and relevant indicators to make index score valid



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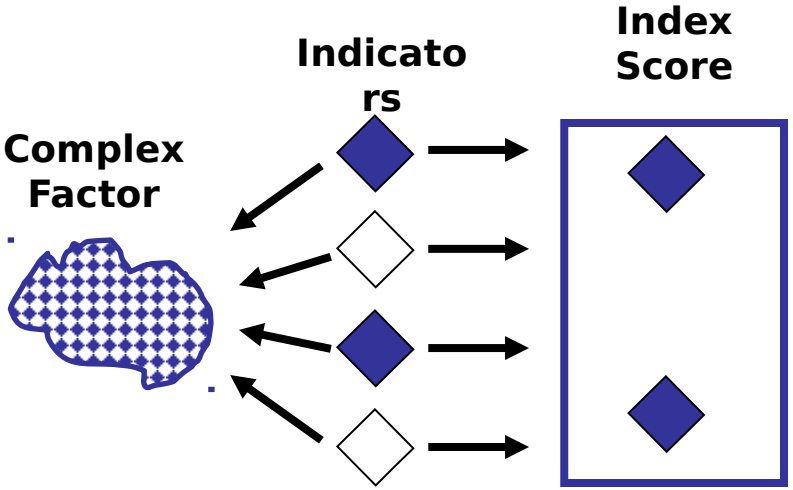
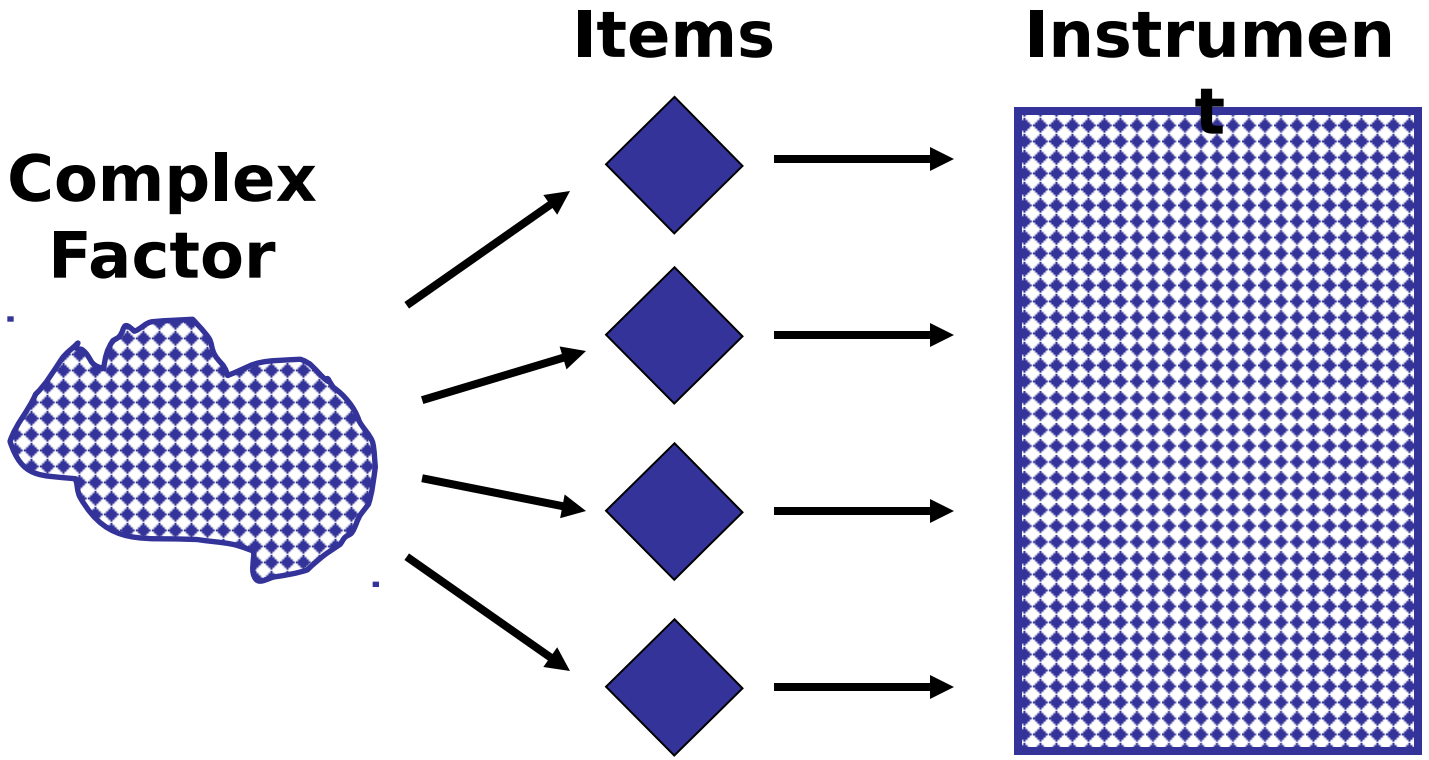


Construct an *Instrument*

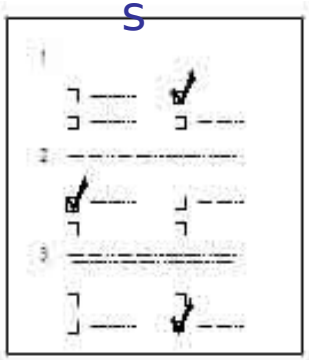
3. CONSTRUCT AN INSTRUMENT

Measurement Instrument: A tool constructed to assign a numerical score to a complex factor directly and specifically



3. CONSTRUCT AN INSTRUMENT

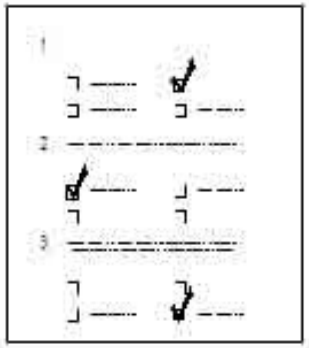
Attitude Questionnaires



EXAMPLES

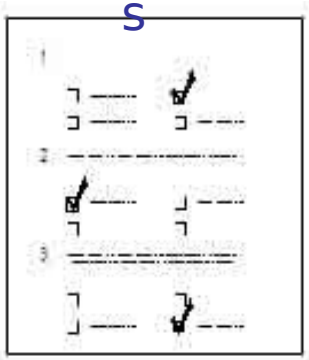
- Composed of multiple items
- Each item assesses a different aspect of the complex factor
- Instrument yields a single score representing the complex factor

Rating Forms



3. CONSTRUCT AN INSTRUMENT

Attitude Questionnaires



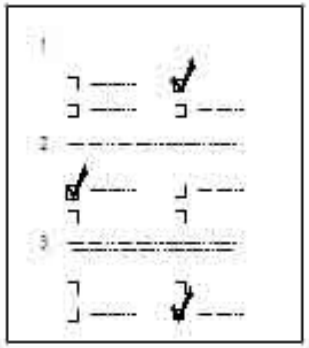
- *Feelings* of respondents towards a single entity
- Final score derived from multiple respondents
- Scores may differ from one respondent to another

SIMILARITIES

- Composed of multiple items
- Each item assesses a different aspect of the complex factor
- Instrument yields a single score representing the complex factor

DIFFERENCES

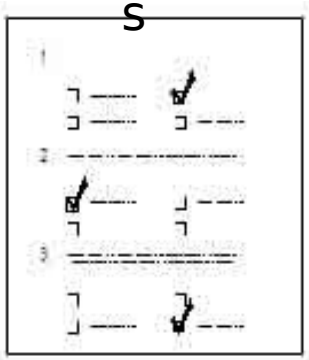
Rating Forms



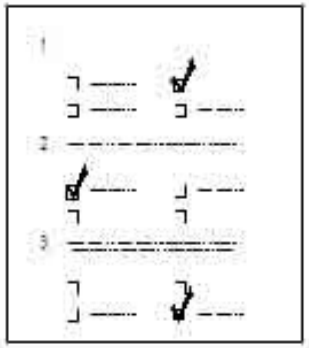
- *Ability* of different entities to meet given standards of performance
- Final score usually derived from a single respondent (rater)

3. CONSTRUCT AN INSTRUMENT

Attitude Questionnaires



Rating Forms



CHARACTERISTICS

- Not dependent on existence of relevant indicators
- Requires extensive time and effort to develop, test and administer

TYPICAL USES

- *Satisfaction with a program, product, or organization*
- *Morale of employees*
- *Performance appraisal of employees*
- *Quality of products*

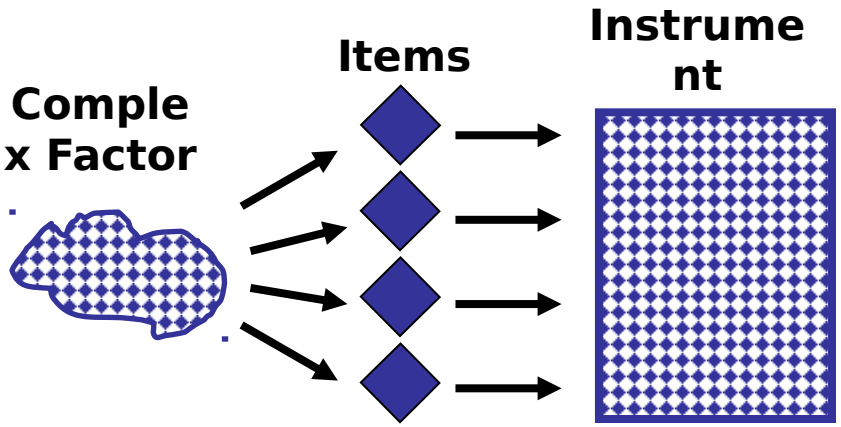
3. CONSTRUCT AN INSTRUMENT

a) Research and write prospective items

b) Select the best items using item analysis

c) Design the administrative technique

d) Test the final instrument for accuracy



3. CONSTRUCT AN INSTRUMENT

Employee Morale Survey:

a) Research and write prospective items

b) Select the best items using item analysis

c) Design the administrative technique

d) Test the final instrument for accuracy

3. CONSTRUCT AN INSTRUMENT

a) Research and write prospective items

Prepare 3 or 4 times number of items in final instrument

Search relevant documents and interview knowledgeable people

Write items

Employee Morale Survey:

- *Management direction*
- *Resource support*
- *Working hours*
- *Facilities and materials*
- *Benefits*
- *Compensation*
- *Opportunity for participation in decision making*
- *Work challenge*

3. CONSTRUCT AN INSTRUMENT

a) Research and write prospective items

b) Select the best items using item analysis

Judges rate items (relevance, importance, ease of understanding).

Best items are selected empirically from a tryout or all items.

Employee Morale Survey:

- Management direction:

My manager clearly tells what I need to do

I can usually count on my manager for help when I need it

I know whether or not I've done a good job

My manager treats me like a valued member of the organization

3. CONSTRUCT AN INSTRUMENT

a) Research and write prospective items

b) Select the best items using item analysis

c) Design the administrative technique

Questionnaire:

Assure a large proportion (e.g., >70%) complete and return the survey

Rating Form:

Use one or more raters as necessary and assure that they will apply the *standards of quality* in an unbiased and competent manner

3. CONSTRUCT AN INSTRUMENT

a) Research and write prospective items

b) Select the best items using item analysis

c) Design the administrative technique

d) Test the final instrument for accuracy

Validity:

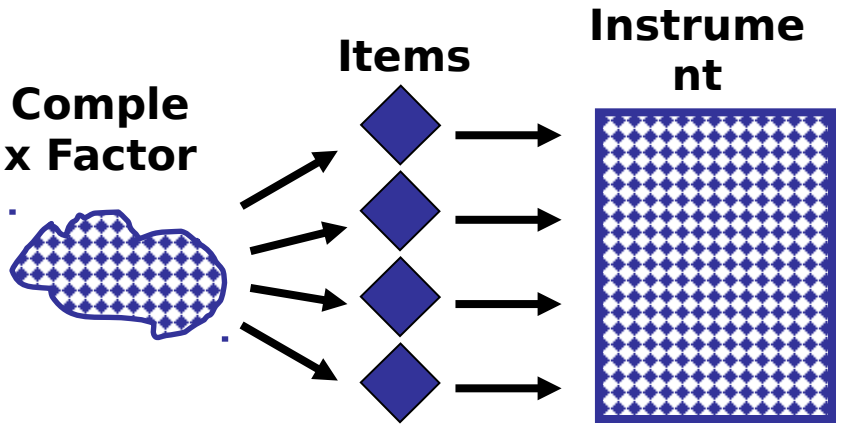
Assigns scores that truly represent the factor intended to measure

Reliability:

Assigned scores are consistent in spite of variations in irrelevant measurement conditions

3. CONSTRUCT AN INSTRUMENT

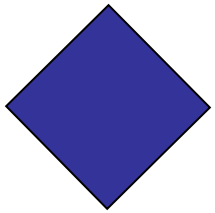
- Lots of Work
- Necessary because use of measure is ***CRITICAL*** for organizational management
- Can potentially be applied to any complex factor
- Although can be proven *accurate*, may suffer a *credibility* problem (some decision makers dismiss anything but "hard" metrics.



SUMMARY

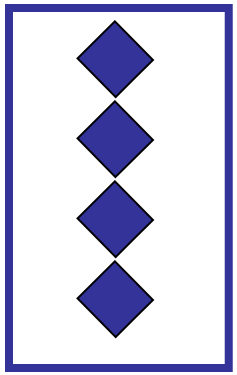
TASK: Measure *Depth of Relationship between Married Couples*

Find an Indicator



Percentage of discretionary time spent in each others' company

Build an Index



Percentage of discretionary time spent in each others' company

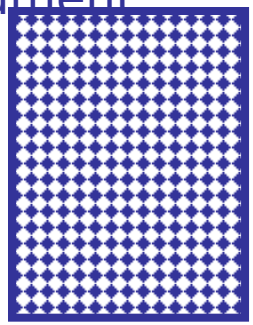
Frequency of physical touching

Frequency of terms of endearment

Length of time of relationship

Number of shared interests

Construct an Instrument



We like the same things

I trust my spouse implicitly

We respect each other's way of thinking

I often have feelings of sexual desire for my spouse

I would remarry my spouse today

SUMMARY

Questions?